DOCUMENT RESUME

ED 284 810 SO 018 328

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TITLE Ongoing Activities to Facilitate Access to Supplementary Materials for Cartographic Education.
PUB DATE Apr 87
NOTE 8p.; Paper presented at the Annual Meeting of the Association of American Geographers (Portland, OR, April 22-25, 1987). Document contains small type.
PUB TYPE Reference Materials - Bibliographies (131) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Annotated Bibliographies; *Cartography; *Educational Technology; Elementary Secondary Education; *Geography Instruction; Higher Education; Instructional Design; *Instructional Development; Instructional Improvement; *Locational Skills (Social Studies); Maps; *Map Skills; Social Sciences; Topography

ABSTRACT

A wealth of unpublished or unstructured educational materials for all aspects of cartographic instruction are widely dispersed and unnecessarily difficult to obtain. The Cartography Assistance Brochures Project of the Cartography Specialty Group of the Association of American Geographers (AAG), the North American Cartographic Information Society, and related organizations aims to improve cartographic instruction. A project description is included along with abstracts of papers presented at various AAG conferences; they are: "The Ten Commandments of Contour Lines and Other Educational Aids about Isolines" (Paul S. Anderson); "Experiential Exercises for Map Readers" (Dennis Fitzsimons); "Map Use Instruction: Measurement of Geographic Features and Associations" (Alan M. MacEachren); "An Exercise in Map Procurement" (Jeffrey C. Patton); "Instruction Aids for Thematic Cartography" (James R. Wray); "Contents and Methods in Map Appreciation Courses" (Paul S. Anderson); "Teaching Map Reading Through a Competitive Tournament" (Laurence W. Carstensen); "Large Classes in Map Use: Bureaucracy, Logistics, and Testing" (Phillip Gersmehl); "Role of Cartographic Values and Ethics in Map Appreciation" (Phillip Muehrcke); "Ongoing Activities to Facilitate Access to Supplementary Materials for Cartographic Education" (Paul S. Anderson); "Videodiscs and Surrogate Travel: Applications in the Instruction of Map Use" (Laurence W. Carstensen); "Map Position Finding from Nonmotion Photographic Images" (Allen B. Cox); "Practical Map Use Exercises" (Dennis Fitzsimons); "Integrating Geographic and Cartographic Concepts in Map Use Instruction" (Alan M. MacEachren); "Map Skills in the North Carolina Curriculum: Exercises for 4th Graders" (Michael W. Mayfield, Jeffrey C. Patton, Joseph W. Bencloski); and "Improving the Army's Packet Protractor" (Michael D. Sublett). (BZ)

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ONGOING ACTIVITIES TO FACILITATE ACCESS TO SUPPLEMENTARY MATERIALS FOR CARTOGRAPHIC EDUCATION

by

Paul S. Anderson

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ONGOING ACTIVITIES TO FACILITATE ACCESS TO SUPPLEMENTARY MATERIALS FOR CARTOGRAPHIC EDUCATION

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Abstract

A wealth of unpublished or unstructured educational materials for all aspects of cartographic instruction are widely dispersed and unnecessarily difficult to obtain. Major sources include instructors of cartography (all aspects), geographers with local area studies, publishers of maps and manufacturers of supplies and instruments. Ongoing activities to overcome this problem are discussed. Specifically the efforts of the Cartography Specialty Group of the AAG and the Education Committee of the North American Cartographic Information Society (NACIS) are summarized.

(A paper for the annual meeting of the Association of American Geographers, Portland, Oregon, 22-25 April 1987.)

Educational Aids for Map Use Studies

For three consecutive years the Cartography Specialty Group (CSG) of the AAG has conducted conference sessions to promote the dissemination of materials to assist in the teaching of map use skills. Almost all of the materials presented were from unpublished sources. Each presenter agreed to make appropriate copies available to other instructors. Many of the materials are ready for immediate classroom use. Sixteen presentations have been made, 5 in Detroit (1985), 4 in Minneapolis (1986), and 7 in Portland (1987). Of the first nine, three are accepted for or are already published. This high percentage is likely to be continued with the 1987 and future conference sessions. The titles, authors and abstracts of these sixteen presentations are attached to this paper to facilitate further dissemination. When classifying the papers according to topics, four major themes are evident. (A) Three presentations deal with map use courses as a whole [6, 8, 9]; (B) three focus on obtaining materials [4, 5, 10]; (C) four present devices to aid map use teaching [1, 11, 12, 16]; and (D) six concentrate on classroom exercises [2, 3, 7, 13, 14, 15]. Comments and suggestions concerning these types of conference activities are appreciated and helpful for future planning.

Cartography Assistance Brochures Project

There is a new project currently proposed for the Cartography Specialty Group, the North American Cartographic Information Society (NACIS) and related organizations.

The proposal is that the commercial cartographic community sponsor and provide educational materials in the form of "Cartography Assistance Brochures" to be distributed for a nominal fee to instructors of cartography at appropriate levels of education. Supplied copies of Cartography Assistance Brochures will be collated, indexed, prefaced, covered and packaged for distribution by the sponsoring organizations. The co-directors of this project are, Paul S. Anderson and Carol Bouchard, can provide further information. As the project becomes more defined,

announcements will be made in various newsletters. The participation of numerous cartography and geography educators plus corporate sponsors should produce some distinctive and highly useful materials to improve the options for map use education nationwide.

Appendix: Educational Aids for Map Use Studies, as presented in the Conference Activities of the Cartography Specialty Group (CSG) of the Association of American Geographers (AAG).

APRIL 1985, DETROIT, MI.

1. Anderson, Paul S., **"The Ten Commandments of Contour Lines and Other Educational Aids about Isolines"** Illinois State University, Normal, IL. [Accepted for publication, Teaching Geography, Journal of The Geographical Association, United Kingdom.]

Instruction in the use and drawing of isolines is dominated by correct illustrations, but students frequently make extremely illogical drawings. Teaching what is NOT to be done helps prevent such errors because students can more readily identify their errors, such as streams flowing in two directions. The Ten Commandments of Contour Lines are "cast in stone" for ease of preparation. Maps and diagrams containing "sinful" errors are used in a series of exercises which culminate in the drawing of simplified isoline maps for actual areas which can then be studied in maps, photographs and diagrams.

2. Fitzsimons, Dennis., **"Experiential Exercises for Map Readers"** Southwest Texas State University, San Marcos, TX.

Students often enroll in a map use course because they have (perceived or real) poor senses of spatial orientation and/or map reading skills. The process of educating these students can be more effective by utilizing each student's own direct and indirect experiences. Examples of exercises which (1) establish individual levels of map interest/involvement/background and (2) challenge students to build from what they already "know" are provided for discussion.

3. MacEachren, Alan M., **"Map Use Instruction: Measurement of Geographic Features and Associations"** University of Colorado, Boulder, CO. (now at Penn. State U).

This presentation addresses instruction in geographic measurement techniques. Goals and methods for teaching measurement procedures are summarized with specific attention given to objective description and comparison of geographic areal features. A two exercise sequence developed to address these topics is presented. The first exercise focuses on area sampling methods. Concepts developed here are then applied to measurement of spatial association of areal features, with emphasis on reliability of statistical measures. The context within which teaching materials and strategies are considered is a course directed to understanding of and appreciation for maps as vehicles for communicating geographic information.

4. Patton, Jeffrey C., **"An Exercise in Map Procurement"** University of North Carolina, Greensboro, NC.

Map interpretation or use courses typically overlook a fundamental stumbling block for most students wishing to use maps, that is where and how to obtain maps. This exercise attempts to address this problem. First students selected an area or city

in the U.S. and a foreign area or city. For both chosen places students, working in small groups, develop lists of available maps, their cost, and how to procure them. Maps which are free or of minimal cost are then obtained. Finally, the resulting maps are used as the sole source by the students to write brief (5-10 pages) geographical descriptions of the areas.

5. Wray, James R., **"Instruction Aids for Thematic Cartography"** U.S. Geological Survey, Reston, VA.

Selected non-serial maps and related publications by USGS are low-cost supplements to standard texts and laboratory manuals for teaching cartography, geography, and remote sensing. Many embody state-of-the-art advances in automated cartography and spatial analysis, and demonstrate timely applications to pressing environmental problems. Techniques represented include integration of spatial data sets, use of coordinate systems, area sampling, area measurement, automated cartography, digital image processing, map design and reproduction, and data capture by remote sensing. Environmental problems represented include hazard mapping, environmental assessment, estimating ground water used for irrigation, and regional estimates of pollution emissions and depositions.

MAY 1986, MINNEAPOLIS, MN

6. Anderson, Paul S., **"Contents and Methods in Map Appreciation Courses"** Illinois State University, Normal, IL.

Map reading course syllabi reveal agreement in core content but diversity in order, methods and individualized content. Primary teaching materials are topographic maps and the Muehrcke textbook, but substantial individualization occurs with additional readings and/or various exercises. Order of content is usually clustered (e.g., all coordinate systems in one block) or interspersed. Teaching methods are influenced by class size, adequate rooms, materials and assistant. Distance education materials for semi-independent instruction of large numbers of students is described. Analytical skills and interpretive thinking are desired objectives for the general students and public as well as geography/cartography majors.

7. Carstensen, Laurence W., **"Teaching Map Reading Through A Competitive Tournament"** Virginia Polytechnic Institute and State University, Blacksburg, VA. [Published, Journal of Geography, (Vol 86, No. 1 Jan-Feb 1987) National Council for Geographic Education (NCGE), Macomb, IL, pp. 30-31].

A map reading tournament is an enjoyable and intellectually stimulating way to end a course in map use. Educational and administrative aspects are presented in the paper. After the competition, the class is enthused about discussing the various strategies used to solve the different types of questions, so additional points concerning map reading of the questions asked, this inexpensive activity can be used by students at any level: college, high school, or even elementary school.

8. Germehl, Phillip, **"Large Classes in Map Use: Bureaucracy, Logistics, and Testing"** University of Minnesota, Minneapolis, MN. [Published with modifications and co-author Sona Andrews, Journal of Geography, (Vol. 85, No. 6 Nov-Dec 1986) National Council for Geographic Education (NCGE), Macomb, IL, pp. 267-270].

A large introductory class in map interpretation can be a valuable addition to a college curriculum--our new course on the Language of Maps satisfies a liberal arts communications requirement, draws well, is rewarding to teach, and helps to attract

majors. At the same time, a large class does pose some problems that differ from those encountered in traditional map-interpretation courses. We use a lecture-and-discussion-group format, a student workbook, and a set of modular tests to teach map use to classes that enroll up to 220 students per term. This paper includes examples of lecture outlines, student worksheets, project ideas, test questions, and behavioral objectives that may be useful for those who wish to propose a similar course at their own institutions.

9. Muehrcke, Phillip, **"Role of Cartographic Values and Ethics in Map Appreciation"** University of Wisconsin-Madison, Madison, WI.

The transformational character of cartographic abstraction requires conception and judgement at every turn. This raises two important issues for the map user. One is that map design may be as much a matter of cartographic values as it is a reflection of geographic reality. The other is that cartographic ethics are a primary guiding force in the design process. Both issues need to be dealt with explicitly if the strengths and weaknesses of maps in environmental thought, communication, and mobility are to be fully appreciated.

APRIL 1987, PORTLAND, OR.

10. Anderson, Paul S., **"Ongoing Activities to Facilitate Access to Supplementary Materials for Cartographic Education"** Illinois State University, Normal, IL.

A wealth of unpublished or unstructured educational materials for all aspects of cartographic instruction are widely dispersed and unnecessarily difficult to obtain. Major sources include instructors of cartography (all aspects), geographers with local area studies, publishers of maps and manufacturers of supplies and instruments. Ongoing activities to overcome this problem are discussed. Specifically the efforts of the Cartography Specialty Group of the AAG and the Education Committee of the North American of the North American Cartographic Information Society (NACIS) are summarized.

11. Carstensen, Laurence W., **"Videodiscs and Surrogate Travel: Applications in the Instruction of Map Use"** Virginia Polytechnic Institute and State University, Blacksburg, Virginia.

As a new technology for the storage of visual information, the videodisc provides the first legitimate method by which to simulate user--controlled movement in the outdoors. The author has developed a computer simulation of the sport of orienteering for use in teaching map use and for use in research into the processes of position finding and decision-making using maps. Though the project is not yet complete, it is clear that the computer--videodisc interface will open up new frontiers for both teaching and research, not only in map use, but throughout the field of geography.

12. Cox, Allan B., **"Map Position Finding from Nonmotion Photographic Images"** Virginia Polytechnic Institute and State University, Blacksburg, VA.

A computer-interactive videodisc orienteering simulation developed at Virginia Tech uses nonmotion photographs of the physical environment to create a simulated environment through which users move. This project gathered information to determine the photographic design for the simulation. Results indicated that: 1) subjects were able to locate a specific map position by viewing nonmotion color

photographs, 2) there appeared to be no significant difference between using views photographed with a 50mm lens and a 28mm lens, and 3) subjects were able to employ traditional orientation techniques to locate map positions.

13. Fitzsimons, Dennis., **"Practical Map Use Exercises"** Southwest Texas State University, San Marcos, TX.

Students sometimes fail to identify the correlation between the use of abstract classroom exercises and the relevance of these exercises in making "real-life" choices. Map use exercises, utilizing a university's map library, are presented which involve students with typical problems associated with buying a house and property. Several scenarios with differing types of available map information and sources, and their correct usage, are offered to stimulate student interest.

14. MacEachren, Alan M., **"Integrating Geographic and Cartographic Concepts in Map Use Instruction"** Pennsylvania State University, University Park, PA.

A pair of exercises are described that deal with acquiring information from thematic maps. The exercises focus on the geographic concept of regional images and illustrate the potential for conflict between spatial and attribute components of these images. In the exercise the map library is introduced as a source of information and techniques for compiling spatial information on a common base are presented. The second exercise deals with statistical techniques for measuring changes in spatial association and compares their use to cartographic depiction of correspondence and change.

15. Mayfield, Michael W., and Jeffrey C. Patton and Joseph W. Bencloski, **"Map Skills in the North Carolina Curriculum: Exercises for 4th Graders"** University of North Carolina, Greensboro, NC.

Recent publicity concerning "geographic illiteracy" has raised a cry for greater emphasis on geography in the grade schools. Unfortunately few elementary teachers have had any training in geography. Clearly there is a need for professional geographers to address this problem. This paper reports on the development of a set of materials and exercises for teaching geographic concepts through map use and on the role that university geographers can play in implementing such a project in elementary school curricula.

16. Sublett, Michael D., **"Improving the Army's Pocket Protractor"** Illinois State University, Normal, IL

The ability of personnel to use UTM coordinates to locate positions on a map, even to the nearest meter in the case of casualty recovery, is of great importance to the United States Army. Magnetic and grid azimuths between points must also be readily available to troops in the field and tacticians in the rear. To assist with these locational and directional determinations, the Army issues a plastic protractor known officially as the Coordinate Scale and Protractor. This paper deals with the development, for both military and civilian map users, of an even more effective, pocket-size map reading device.

The "Cartography Assistance Brochures" Project
From the Education Committee of NACIS

Project Description:

Objective: Cartographic education can be improved by providing instructors with "ready-to-use" examples and exercises for teaching about cartographic products (maps, globes, etc.) and how they are made (processes, equipment, materials and services).

Expert professors could develop those teaching materials, but the dissemination to others would either be slow or would require a publisher (with associated costs). Alternative sources of teaching materials are the people, organizations, and companies who have commercial interests in the well-being of cartography. Those map makers, map dealers, equipment suppliers and others have not only a vested interest in cartography, they also have specific areas of expertise. Many have already published maps and sales brochures, for which they have both copyright control and access to the original camera-ready art work.

The proposal is that the commercial cartographic community sponsor and provide educational materials in the form of "Cartography Assistance Brochures" to be distributed for a nominal fee to instructors of cartography at appropriate levels of education. Supplied copies of Cartography Assistance Brochures will be collated, indexed, prefaced, covered and packaged for distribution by NACIS through its Education Committee.

End Product: The format size is 8 1/2 x 11 inches, for reasons of subsequent copying. The first set of brochures is to have fifty to one hundred sheets. If fewer pages are provided initially, the project will distribute those made available. Sheets can be single-sided or double-sided. Copyright is retained by each contributor, but permission needs to be granted to NACIS for subsequent non-commercial reproduction for educational purposes. Copyright for the overall work is by NACIS. The first edition is to be of 1000 to 2000 copies, depending on the number of pre-publication sales and the willingness of the suppliers of the content sheets. Many pages will probably be high quality black-and-white items. They should be suitable for teachers to make good quality overhead transparencies and/or photocopies for classroom use. Contributors that provide color items should consider supplying additional copies (perhaps at cost) to teachers who write and request a classroom "teaching set" that can be used over several years. An example (preliminary draft) of a Cartography Assistance Brochure is attached in the Contents section below.

Supply of Pages: Contributing organizations and companies will prepare and supply the separate Cartography Assistance Brochures. It is anticipated that each page will usually relate to the products or commercial interests of the contributor. All contributions (pages) must be approved by NACIS. It is understood that the supplier's commercial interests can be clearly evident on each sheet but not to the detriment of the educational value of each page.

Each contributor is to provide and deliver 1000 or 2000 ready-for-collation copies at no cost to NACIS, plus pay ten (10) cents per sheet "handling contribution" for each standard-sized sheet to be distributed. This cash contribution is an extremely low cost for a company to inform hundreds of cartography/map use instructors and their students about their products.